

when the oxygen in the vicinity of the liquid fuel had been consumed and the flames were forced to find a fresh supply in the southwest corner of the building. This stage of the fire was highly speculative since the flames were no longer available to provide the heat needed to vaporize the diesel fuel in the pool. At any rate, the sustained temperature in the vicinity of Column 79 did not exceed 400 °C. Thus, the column temperature would not have risen to the point where significant loss of strength could have occurred. The generators in the northeast, northwest, and southwest sections would likely have all ceased to operate at these temperatures. Neither Column 79 nor the 7th floor composite floor system would have been thermally weakened.

Scenario 1.d, louvers open, fans inoperable: This fire was similar to Scenario 1.c, in that there was no forced air from the fans, but the louvers were open, augmenting the convection. The steady fire intensity would have been about 30 MW to 40 MW.

Result: The FDS simulation showed that the natural flow from the fire plume would have been out of the louvered openings on the east side of the building in a very short time. Significant plumes of smoke would have been seen emerging from the building within a few minutes of ignition, contradicting the visual evidence.

Fire Scenario 2

The pool of diesel fuel was located in the southwest generator room (location (b) in Figure 9-1) and assumed to be about the same size as in Scenario 1.a: 6 m square, with a fuel flow of 1.8 L/s. The corridor on the west side of the core was assumed to be open, along with the louvers on the east and west sides of the 5th floor; the ventilation fans were assumed to be off.

Result: The air flow through the breach in the south wall was sufficient to consume the fuel and support an approximately 60 MW fire. The temperatures near the ceiling of the 5th floor above the southwest corner generator room quickly exceed 1000 °C, which would have caused the generators in this corner to fail soon after the fires would have begun. The generators on the north side would not have been able to operate after their fuel supply line was broken. However, if, somehow, enough fuel was able to keep at least one generator operating, the temperatures near the ceiling of the 5th floor might have reached the close-to-steady state shown in Figure 9–7. Note that the ceiling in the generator room was the bottom of the 7th floor slab. The plume from the fire was predicted to extend well outside the breach on the south wall. There was no photographic evidence of fires originating from this area; however, the actual fire would have been difficult to distinguish from the plumes of other fires and dust on the south side of WTC 7. The nearby columns, especially those whose insulation was damaged by the debris from WTC 1, likely would have reached temperatures high enough to decrease their strength substantially. However, this scenario provided no open path for the hot gases to reach Columns 79. Any weakening of the 7th floor composite floor system would have been on the south side of the building, in the same region as the debris damage from the collapse of WTC 1.